BISON CONTROL AREA PROGRAM ANNUAL REPORT DECEMBER 2011 - APRIL 2012

South Slave Region

Environment and Natural Resources
Government of the Northwest Territories

2014

Manuscript Report No. 240

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ABSTRACT

Bison in Wood Buffalo National Park (WBNP) and the Slave River Lowlands (SRL) are infected with bovine tuberculosis and brucellosis while both the Nahanni and Mackenzie bison populations are free of these livestock diseases. To help protect the disease-free status of these two populations, the Government of the Northwest Territories (GNWT) implemented the Bison Control Area (BCA) program in 1987. The BCA objective is to reduce the probability of disease transmission between herds by preventing bison from moving through or establishing herds within the area south of the Mackenzie River between the Trout and Buffalo Rivers. In order to keep this area free of bison, aerial surveys are flown to search for bison, and public participation by reporting any sightings or signs of bison is encouraged.

This program continued through the 2011/2012 season with ten weekly shoreline patrols, a semi-comprehensive survey, and a comprehensive survey. In total, 81.5 hrs. were spent flying these surveys in fixed-wing aircraft over 19 days. Throughout the season, radio announcements and newspaper advertisements helped to communicate the purpose of the BCA and why public reports of bison are important to the program. Eight new BCA highway signs were created, six of which were installed. The remaining two signs will be installed near Fort Providence when the Dehcho bridge construction is completed.

During the 2011/2012 season, there were no reports of Bison in the BCA.

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INTRODUCTION

The history of wood bison in the Northwest Territories (NWT) and the disease status of bison herds in the NWT are reviewed in previous annual reports on the Bison Control Area (BCA) (e.g. Sayine-Crawford et al. 2012, Greig and Cox 2012). Additional literature sources are listed in the bibliography in Appendix F.

The BCA was established in 1987 to reduce the risk of bovine tuberculosis and brucellosis infected bison in the Slave River Lowlands (SRL) and Wood Buffalo National Park (WBNP) coming in contact with disease-free bison in the Mackenzie, Nahanni and Hay-Zama (Alberta) populations (Figure 1). The BCA is intended to be a buffer zone between infected and uninfected populations where bison are prevented from becoming established. This zone encompasses over 39,800 km^2 bounded in the south by the NWT border, in the north by the Mackenzie River and Great Slave Lake, in the west by the Trout River and in the east by the Buffalo River. All bison found within the BCA are assumed to be diseased and are removed and tested.

Since 1993 the bison control program has been jointly funded by the Government of the Northwest Territories (Environment and Natural Resources) and the Government of Canada (Parks Canada Agency). Both governments realize the importance of maintaining healthy wood bison herds and promoting the growth of the species.

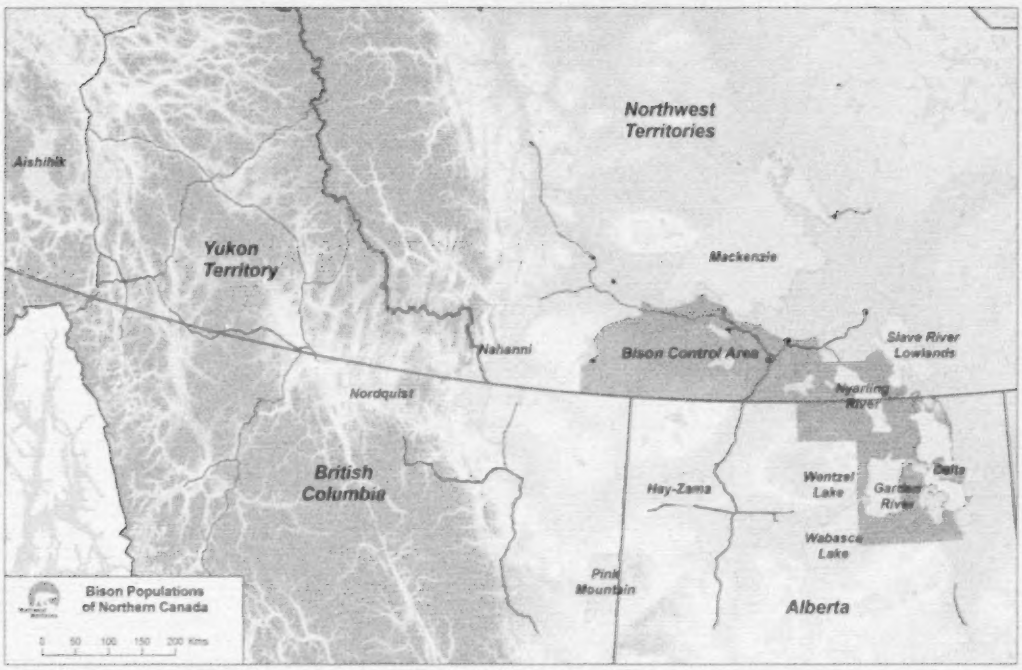

Figure 1. The current distribution of bison (*Bison bison*) in northern Canada. All populations are wood bison, except Pink Mountain which is plains bison.

The objectives of the BCA program are to prevent bison from moving between the SRL/WBNP and the Mackenzie, Nahanni and Hay-Zama populations by detecting and removing any bison that may come into the area. To achieve this we:

- Conduct aerial surveillance of the BCA during the winter months;
- Maintain the BCA free of bison and prevent any herds from establishing within its limits;
- Increase public awareness about the program; and
- Confirm disease status of any bison found in the BCA.

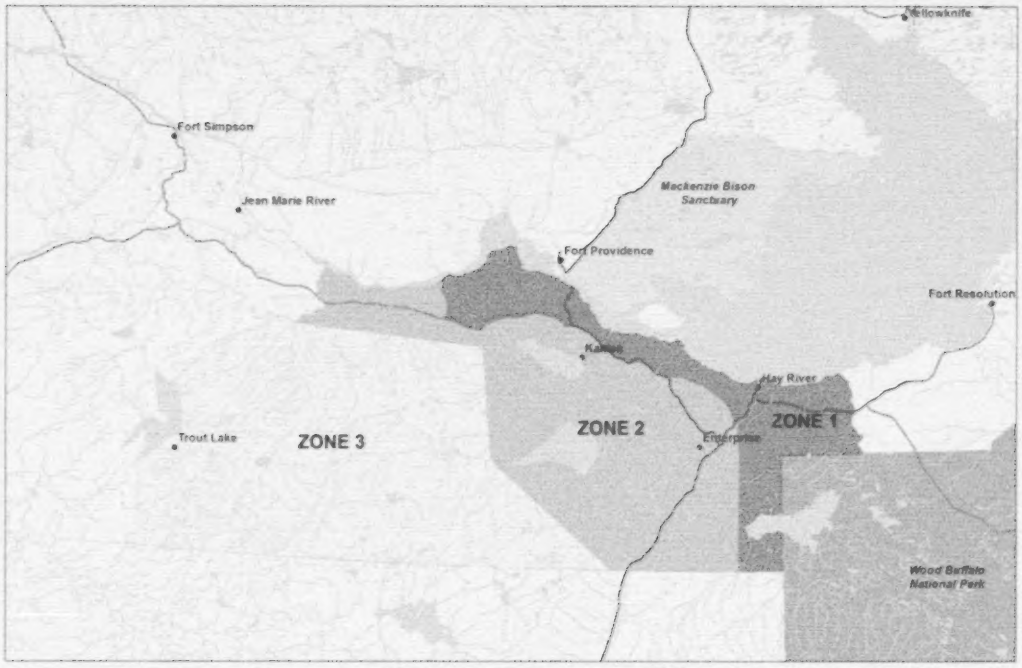

Figure 2. The BCA and its stratification into three zones.

METHODS

Survey methodology was similar to that used in previous years (Gates et al. 1992, Williamson et al. 1995, Bohnet and Gates 1997, Nishi 2002, Boulanger et al. 2002, Bidwell et al. 2004, Campbell et al. 2004, Hartop et al. 2009) to assure repeatability and comparability of wildlife sightings. The exception to this is that transect markers were not used on the windows or wings since the purpose of the BCA program is to determine presence/absence of bison and is not to conduct a population survey.

The BCA is stratified into three zones (Figure 2). Zone I is the area in which bison are most likely to be seen, since it is the section of the BCA that is nearest to both the Mackenzie Bison Sanctuary and WBNP. Therefore, the program focuses on this particular zone, with more frequent aerial surveillance in the form of weekly shoreline patrols. Zone II is a larger zone and is only surveyed twice a year during semi-comprehensive and comprehensive surveys. Surveillance of Zone III relies on reports from people living and travelling in the area instead of aerial surveys.

Aerial surveillance is conducted during the winter months when bison and signs of their presence (feeding craters and tracks) are most visible. Also, the probability of bison moving through the BCA is the greatest in the winter because we assume bison are more likely to walk across the frozen Mackenzie River than swim across it in the summer.

All the flights were flown using a Cessna 337, from Landa Aviation. Community representatives from Fort Providence and Hay River were hired as observers on survey flights. Each shoreline patrol was conducted by the pilot and a minimum of one observer. In many cases a Natural Resources Officer from Fort Providence was also able to participate as an observer. The Wildlife Technician from the Environment and Natural Resources (ENR) office in Fort Smith conducted the semi-comprehensive survey while a BCA technician was hired to conduct the comprehensive survey. Two community observers assisted

with the semi-comprehensive and comprehensive surveys. During all surveys the aircraft flew 150 - 250 m above ground level and at speeds of 180 - 220 km/h.

Shoreline patrols occurred throughout the period when river crossings on ice were possible, with an interval of around seven days. These patrols were flown along the Mackenzie River's shores between Pointe Desmarais and Axe Point and took approximately three hrs. to complete (Figure 3). Patrols ended when reduced snow cover made bison and their tracks difficult to see, and ice conditions on the Mackenzie River deteriorated to the point where crossing by bison became less likely than in mid-winter.

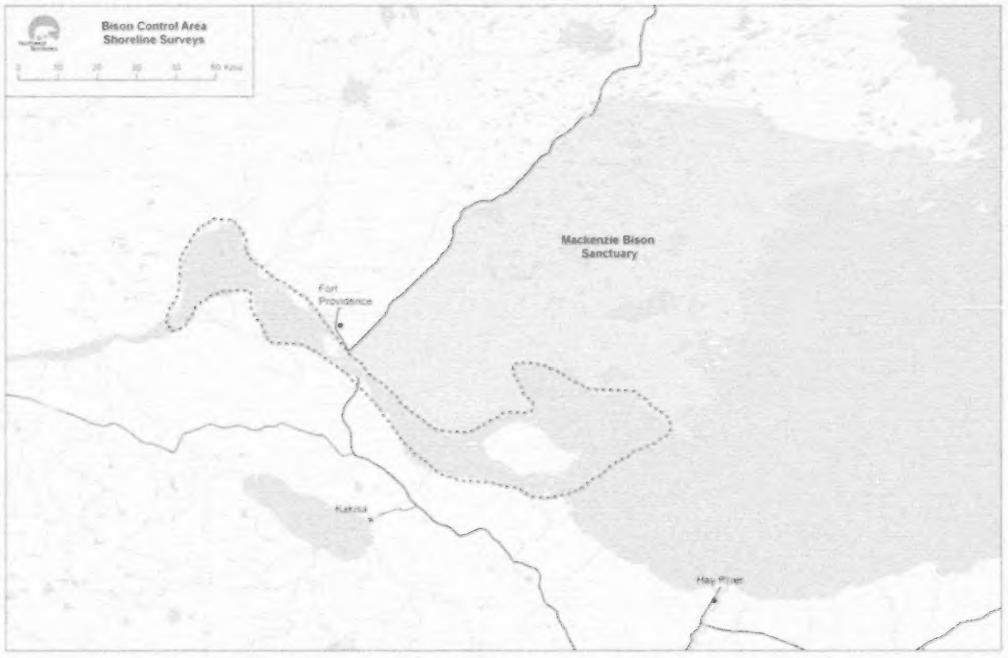

Figure 3. The approximate route followed for the weekly shoreline surveys is indicated with a blue line.

A semi-comprehensive survey covering Zones I and II was flown in February 2012 (Figure 4) and a comprehensive survey was flown in March 2012, also covering Zones I and II but at a higher intensity (Figure 5). Both surveys followed the same transect lines that had been flown in previous years. Additional flight time off the planned route during the semi-comprehensive survey was to relocate boreal caribou fitted with VHF collars.

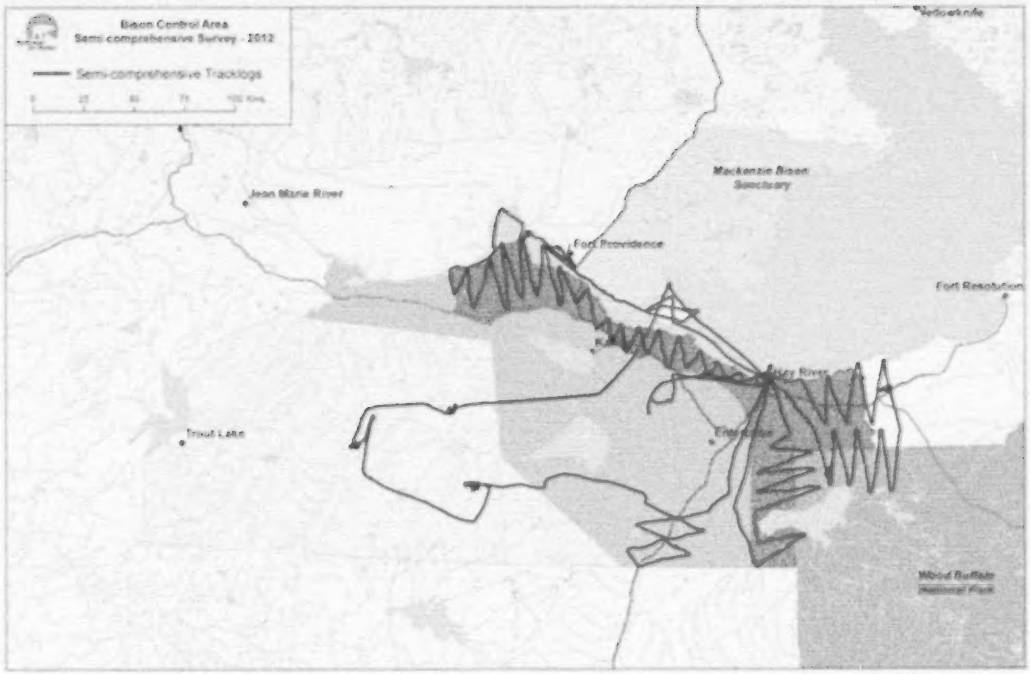

Figure 4. Routes followed during the semi-comprehensive survey. The additional flights from the planned route were to relocate boreal caribou collars.

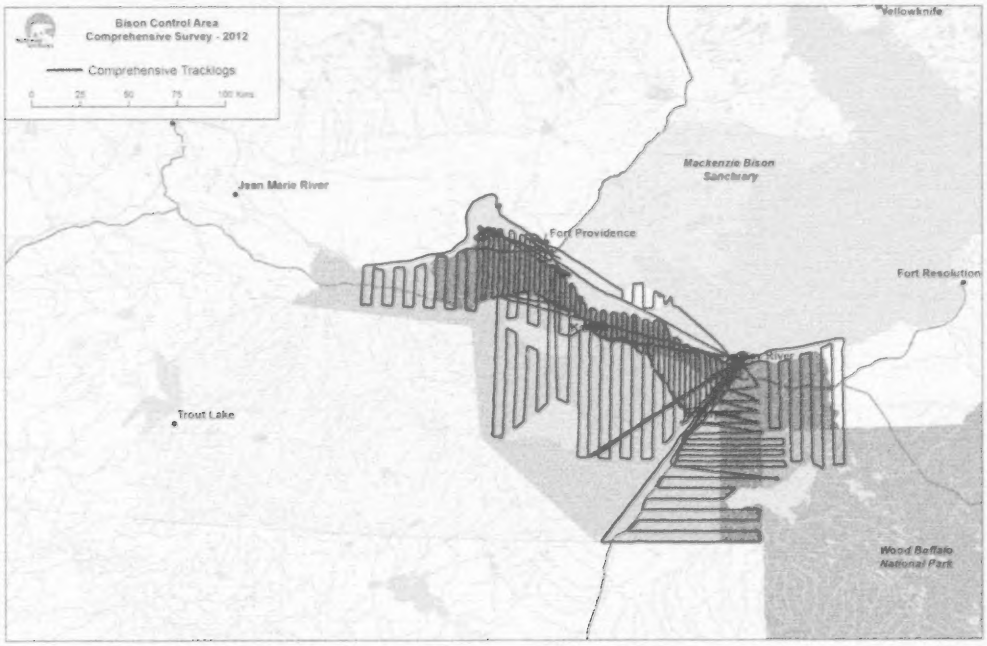

Figure 5. Routes followed during the comprehensive survey.

During all surveys, any tracks and wildlife observed were documented and their location recorded. If any tracks appeared like they might be bison tracks the aircraft would circle so that observers could take a better look to determine the type of tracks. During most survey flights, navigation and data recording was done using a handheld GPS and datasheets. A portion of the comprehensive survey utilized the program ArcPad® by ESRI on a Panasonic® Toughbook (Model CF-19) with a Garmin hand-held GPS. The Toughbook was replaced with handheld GPS and datasheets after technical malfunctions.

RESULTS

During the 2011/2012 season, there were no reports of bison either entering or approaching the BCA. Twelve aerial surveys were completed in 81.5 hrs. over 19 days of flying (Tables 1, 2). All 1,461 bison observations and tracks observed during the surveys were seen north of the Mackenzie River, outside of the BCA. Weather conditions were recorded for each survey flight (Appendix B). Snow cover, weather and light conditions for detecting bison and their sign from the air were good to excellent for most surveys except for a few days when low intensity, flat light conditions were encountered. If the light or weather conditions were exceptionally poor the flight would be terminated or delayed until the next day.

Shoreline Patrols

During all of the shoreline patrols a total of 1,461 bison, 49 moose, 20 caribou and 36 wolves were observed (Table 1, Figure 6). The weekly shoreline patrols began on 16 December, 2011 and finished on 19 April, 2012. Shoreline patrols were not always completed at regular intervals due to weather and Landa Aviation's schedule. Total flight time for the eleven shoreline patrols was 24.8 hrs. with a mean duration of 2.5 hrs. (Table 2). These times do not include ferry time between Hay River and Fort Providence which was approximately 1.0 hr. per flight for a total of 9.8 hrs. Ferry times should also be taken under consideration when discussing detection effort since these positioning flights are through the BCA and the pilots are also considered to be valuable observers.

Table 1. All recorded observations of animals and tracks seen during the shoreline surveys.

Shoreline Surveys	Bison	Moose	Caribou	Caribou Tracks	Wolf	Large Mammal Kill Site
16-Dec	276	3	20	0	0	0
12-Jan	218	2	0	0	7	1
19-Jan	122	6	0	0	5	0
27-Jan	88	7	0	0	0	0
1-Feb	140	13	0	0	9	0
17-Feb	252	8	0	0	0	0
24-Feb	183	6	0	1	12	1
2-Mar	137	4	0	0	2	0
13-Apr	29	0	0	0	1	0
19-Apr	16	0	0	0	0	1
TOTAL	**1,461**	**49**	**20**	**1**	**36**	**3**

Table 2. Summary of BCA shoreline surveys for the 2011/12 season.

Survey	Date	Hrs. Flown	Survey	Date	Hrs. Flown
1	16 Dec 2011	2.5	6	17 Feb 2012	2.1
2	12 Jan 2012	2.0	7	24 Feb 2012	3.0
3	19 Jan 2012	2.3	8	2 Mar 2012	2.5
4	27 Jan 2012	2.1	9	13 Apr 2012	3.2
5	1 Feb 2012	2.5	10	19 Apr 2012	2.6

Total hrs. on survey = 24.8 (There was an additional 9.8 hrs. of positioning aircraft between Hay River and Fort Providence).

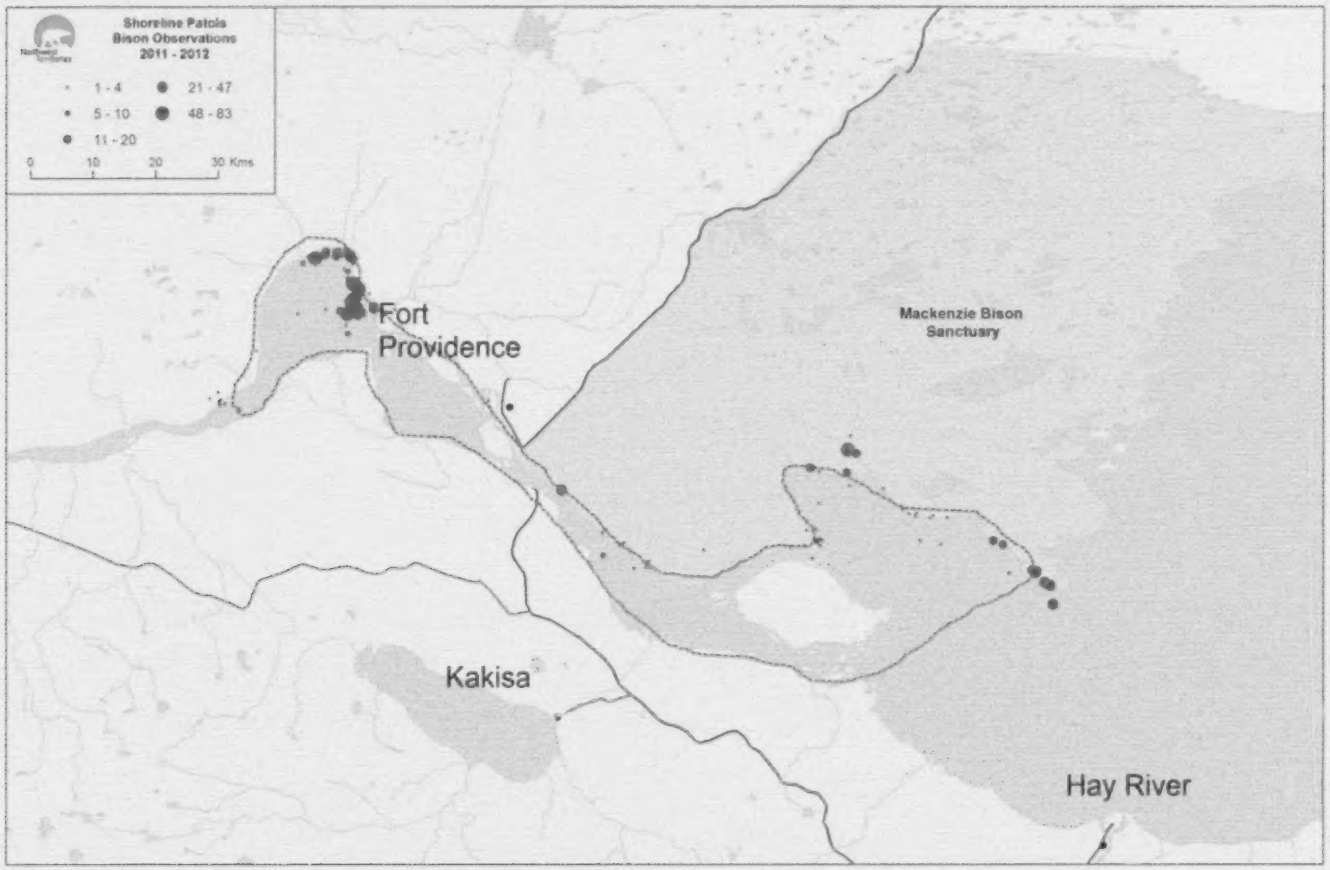

Figure 6. Recorded observations of bison during the shoreline patrols from 16 December, 2011 - 19 April, 2012. The dark blue line indicates the approximate route followed for the weekly shoreline patrols. **Note:** Some observation points are on the lake, however this is due to GPS error and the fact that all the GPS points were taken while in flight (and in some cases hand-transcribed). In actuality, all the bison observations were on the north shore of the Mackenzie River.

The final shoreline patrol of the 2011/2012 season was flown on 19 April, 2012. Flights were continued to this date because of the cool weather in April, which kept snow conditions intact. There was a brief cold snap in mid-April which slightly delayed the spring melt. After 17 April a warming trend ensued. It was determined that ice conditions in these areas would likely continue to degrade very quickly and deter bison from crossing the Mackenzie River.

Transect Surveys

A total of 115 bison, 32 moose and 20 boreal caribou were observed during the semi-comprehensive survey (Table 3).The semi-comprehensive survey flight was flown 6-8 February, 2012 and took 15.6 hrs. to complete (Table 4). This survey covered approximately 2,960 km of transects lines. This equates to an estimated 7.4% coverage of the BCA assuming an average transect width of 500 m on each side of the aircraft. During the semi-comprehensive survey, the aircraft was also used to deviate from the transect lines to search for boreal caribou VHF collars. Observations were recorded throughout this portion of the flight as well; however, most of the additional flying was done at a higher altitude (as high as 5000' above sea level). Locations of bison and bison tracks observed during the semi-comprehensive survey are summarized Table 3 and Figure 7.

Table 3. All recorded observations of animals and tracks seen during the semi-comprehensive survey, 6-8 February, 2012. The track counts are counts of the occurrences of tracks and not an estimation of animals.

Type	6-Feb	7-Feb	8-Feb	TOTAL
Bison	0	3	112	115
Bison Tracks	0	0	2	2
Moose	2	17	13	32
Moose Tracks	21	39	52	112
Boreal Caribou	0	4	16	20
Boreal Caribou Tracks	17	26	28	71
Unknown Large Mammal Tracks	2	2	2	6

Table 4. Summary of BCA transect surveys for the 2011/12 season.

Survey	Date	Hrs. Flown
Semi-Comprehensive	6 Feb 2012	3.3
Semi-Comprehensive	7 Feb 2012	6.3
Semi-Comprehensive	8 Feb 2012	6.0
Semi-Comprehensive	Total	**15.6**
Comprehensive	21 Mar 2012	2.8
Comprehensive	22 Mar 2012	6.8
Comprehensive	23 Mar 2012	4.0
Comprehensive	24 Mar 2012	4.5
Comprehensive	25 Mar 2012	6.6
Comprehensive	27 Mar 2012	6.6
Comprehensive	Total	**31.3**

The comprehensive survey was flown between 21-27 March, 2012 (Figure 5). This survey took 31.3 hrs. to complete (Table 3). Over 6,081 km of transect lines were flown, with an estimated 15.2% coverage of the BCA (based on 500 m transect width on each side of the aircraft). During the comprehensive survey 27 bison, 28 moose, one boreal caribou and seven wolves were observed (Table 5). Locations of bison and bison tracks observed during the comprehensive survey are summarized in Figure 8.

Table 5. All recorded observations of animals and tracks seen during the comprehensive survey, 21-27 March, 2012. The track counts are counts of the occurrences of tracks and not an estimation of animals.

	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	27-Mar	TOTAL
Bison	0	0	0	0	0	27	27
Bison Tracks	0	0	0	0	4	13	17
Moose	4	9	0	3	10	2	28
Moose Tracks	38	65	6	41	81	77	308
Boreal Caribou	0	0	0	1	0	0	1
Boreal Caribou Tracks	10	38	4	18	93	1	164

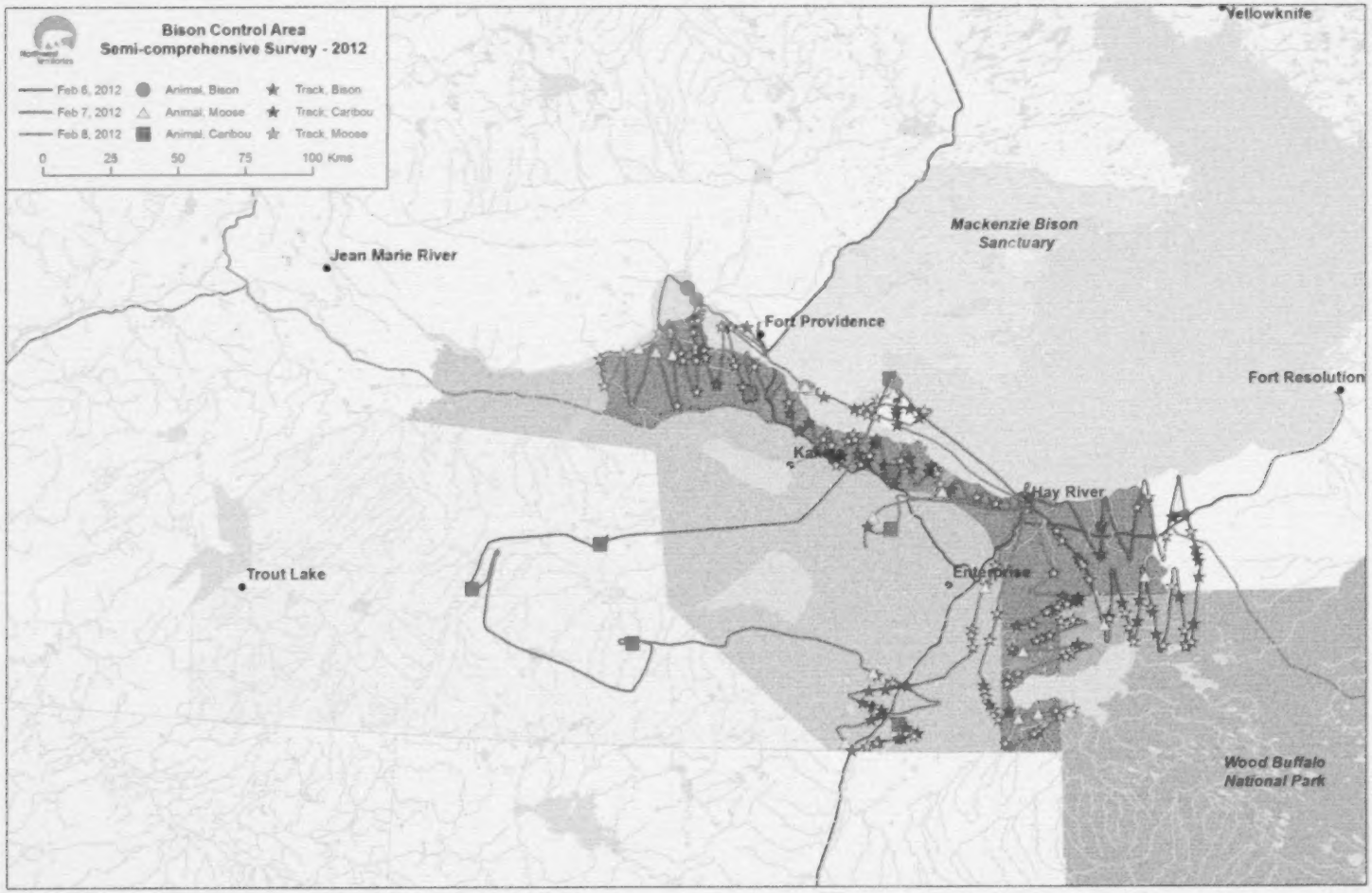

Figure 7. All bison and bison track observations recorded during the semi-comprehensive survey, 6-8 February, 2012

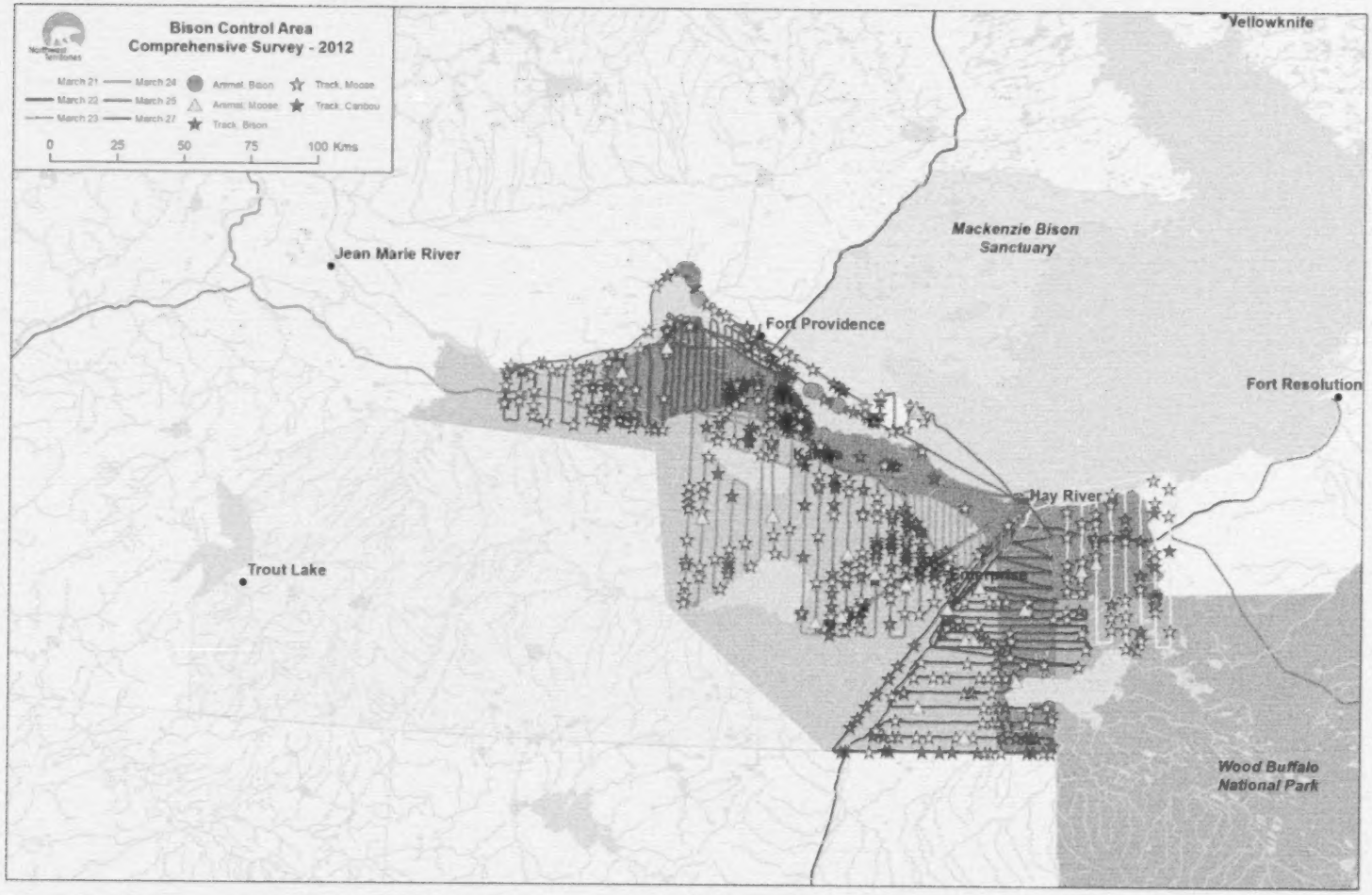

Figure 8. All bison and bison track observations recorded during the comprehensive survey, 21-27 March, 2012.

Public Awareness

This year, public awareness included radio and newspaper advertisements. Newspaper advertisements were placed in The Hub, The Slave River Journal, and the NWT News/North (Appendix C). These advertisements are meant to remind people of where the BCA is and who to call if they see a bison in this area. They are run in September, to target people at times when they are most likely to see bison, while travelling or hunting.

A radio announcement was aired on CJCD to inform the public about the BCA and alert anyone travelling through the BCA to report bison sightings to the nearest ENR office (Appendix D). CJCD aired 30 second long announcements twice a day every Friday, Saturday and Sunday from 2 September, 2011 - 30 October, 2011. There were 13 additional spots spread across 17-19 October, 2011. A total of 66 spots were aired. Radio advertisements were scheduled to reach people at times when they would be more likely to be travelling through the BCA and may see bison.

New signage for the BCA was created this year to replace the existing aging and deteriorating signs on NWT highways. The purpose of the past and new signage is to raise awareness of the BCA, inform motorists they are entering or leaving the BCA, and provide information on what to do if a bison is observed within the BCA. Two signs have been deployed on three of the four locations where highways cross the BCA boundaries. The signs near the Dehcho bridge were delayed pending the completion of road construction and will be erected when construction is completed.

Figure 9. Old (top row) and new (bottom row) signs where highways cross the BCA boundaries.

DISCUSSION

No reports of bison near or in the BCA were received during the 2011/12 season. There was a report of two bison west of Buffalo River in spring of 2011 (2010/2011 season) that could not be relocated during an aerial surveillance of the area and the tracks in the area were too melted to determine whether they were from bison or moose. There were no additional reports of these animals and the area was given additional scrutiny during both the semi-comprehensive and comprehensive surveys.

Although there were no reports of bison in the BCA during 2011/12, public reports have historically been an important means of detecting bison within the control area. The new signs installed along highways this year provide more information and are larger than the previous signs, and should promote public awareness of the BCA.

ACKNOWLEDGEMENTS

Several people were integral to the smooth running of the BCA program for the 2011/2012 season. Renewable Resources Officers Edward Landry and Danny Beaulieu, and Community Support Clerk Carol Bonnetrouge helped arrange for community observers. Bart Hartop was the BCA technician for the comprehensive survey. Thank you to Ella Stinson for her help with the public advertisements.

The community observers were indispensable and we thank all of them for assisting on our surveillance flights: Darcy Bonnetrouge of Fort Providence, and John Mandeville and Lyle Froehlich of Hay River. Many thanks also go to Landa Aviation Ltd. and their pilots Darcy King and Tyler King for their expertise and input as well as help that went beyond the requirements of their job. Thank you to Allicia Kelly and Terry Armstrong for reviewing earlier drafts of this manuscript.

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APPENDIX A: SUMMARY OF SURVEILLANCE ACTIVITIES AND REMOVALS OF BISON FROM THE NWT BCA (1988/89-2011/12)

Year	Shoreline Patrols	Semi-Comprehensive Surveys	Comprehensive Surveys	Total Hrs.	Snowmobile Ground Patrols	Bison Removals
1988/89	1					
1989/90	2					
1990/91	2					
1991/92		7				
1992/93			3			9[a]
1993/94	14[b]		1		23	
1994/95	10 (26)[c]	6 (94)	1 (34)	153	33	2[d]
1995/96	11 (35)	3 (48)	1 (41)	123		3[e]
1996/97	21 (62)	3 (45)	1 (46)	153		
1997/98	14 (43)	3 (46)	1 (48)	137		
1998/99	14 (43)	2 (30)	1 (45)	117		
1999/00	14 (42)	2 (28)	1 (46)	115		
2000/01	13 (40)	2 (30)	1 (50)	120		
2001/02	14 (42)	2 (29)	1 (42)	113		
2002/03	11 (25)	2 (22)	1 (40)	87		
2003/04	13 (31)	1 (11)	1 (37)	78		
2004/05	12 (29)	1 (14)	1 (33)	76		
2005/06	11 (23)	1 (14)	1 (36)	88		
2006/07	12 (38)	1 (19)	1 (36)	93		
2007/08	13 (40)	1 (15)	1 (33)	88		
2008/09	11 (33)	1 (15)	1 (30)	78		
2009/10	9 (27)	1 (13)	1 (13)	53		
2010/11	11 (30)	1 (17)	1 (27)	74		1[f]
2011/12	10 (25)	1 (16)	1 (23)	64		

[a] 17 May 1992: seven bulls shot near Point de Roche
31 May 1992: one bull shot near Point de Roche (no lymph nodes collected)
Serological testing for *Brucella* was negative for all nine bulls, no lesions consistent with tuberculosis observed on gross pathology or histopathology

[b] Four patrols covered the Hay River area and extended inland to the northwest park boundary

[c] Numbers in brackets represent survey hrs. (rounded to the nearest hr.)

[d] 8 March 1995, one cow shot by hunter along south shore of Mackenzie River. Cow had likely been wounded by wolves. Blood serum and retropharyngeal lymph nodes collected.
13 October 1994, prior to the surveillance season beginning, one bison shot by hunter near the eastern boundary of the BCA. Blood and tissue samples collected but no evidence of brucellosis or tuberculosis.

[e] 19 March 1996: three cows killed by hunter on the south shore of Mackenzie River. Blood serum (n=2) and retropharyngeal lymph nodes (n=3) collected. No serological reactors to *brucella*, and lymphatic tissue normal on gross examination.

[f] 5 January 2011: one injured young of the year female was killed by a fisherman north of Hay River on Great Slave Lake (coordinates: 60° 59' 17.1"N 115° 51' 05.5"W). It was

collected on 12 January and brought back to Fort Smith. A necropsy was performed and wounds were found on the front left shoulder and the hindquarters and appeared to be from a wolf attack. Retropharyngeal, submandibular, prefemoral, prescapular, popliteal and bronchial lymph nodes and tonsils were collected for testing.

APPENDIX B: WEATHER CONDITIONS DURING THE BCA PROGRAM, SEASON 2011-2012

Table B.1. Weather data during the shoreline patrols

Date	Patrol#	Temp*	Winds*	Sky	Light	Intensity	Snow Cover
Dec. 16	1	-17°C	9 KTAS @ 290	Scattered	Bright	Medium	Complete
Jan. 12	2	-15°C	Calm	N/A	N/A	N/A	N/A
Jan. 19	3	-25°C	7 KTAS @ 220	Scattered/Overcast	Bright	High	Complete
Jan. 27	4	-32°C	7 KTAS @ 300	N/A	N/A	N/A	N/A
Feb. 1	5	-21°C	5 KTAS @ 290	Clear	Bright	High	Complete
Feb. 17	6	-4°C	8 KTAS @ 160	Scattered	Bright	High	Complete
Feb. 24	7	-17°C	4 KTAS @ 050	Broken	Bright	High	Complete
Mar. 2	8	-15°C	7 KTAS @ 090	Scattered	Variable	Medium	Complete
Apr. 13	9	-9°C	9 KTAS @ 010	Overcast	Flat	Medium	Complete
Apr. 19	10	+3°C	7 KTAS @ 070	Clear	Bright	High	Complete

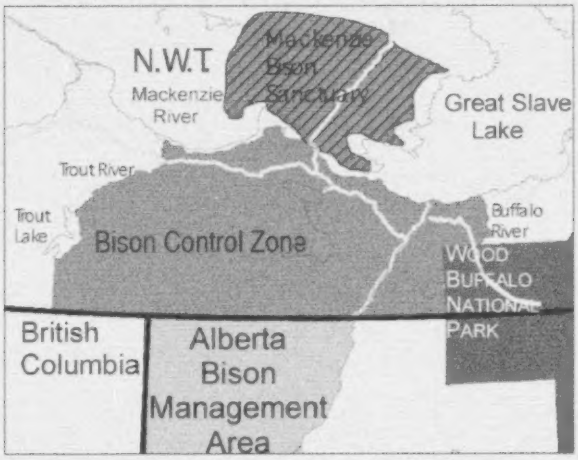
*Weather data from Environment Canada - Hay River Airport at 12:00 hrs.

Table B.2. Weather data during the semi-comprehensive and comprehensive surveys

Date	Survey	Temp	Winds	Sky	Light	Intensity	Snow Cover
Feb. 6	Semi	-5°C	10 KTAS	Clear	Bright	High	Complete
Feb. 7	Semi	-10°C	5-10 KTAS	Clear	Bright	High	Complete
Feb. 8	Semi	-15°C	10 KTAS	Broken	Bright	Medium	Complete
Mar. 21	Comp	-23°C	15 KTAS	Clear	Bright	High	Complete
Mar. 22	Comp	-28°C	Calm	Clear	Bright	Medium	Complete
Mar. 23	Comp	-26°C	10 KTAS	Overcast	Flat	Low	Complete
Mar. 24	Comp	-9°C	5 KTAS	Clear	Bright	Medium	Complete
Mar. 25	Comp	-20°C	5 KTAS	Scattered	Bright	Medium	Complete
Mar. 26	Comp	Weather too poor to fly					
Mar. 27	Comp	-16°C	5 KTAS	Clear	Bright	High	Complete

APPENDIX C: QUARTER PAGE BLACK AND WHITE ADVERTISEMENTS THAT WERE RUN IN THE HAY RIVER HUB, NEWS NORTH, AND SLAVE RIVER JOURNAL.

Bison Control Zone



A control zone, preventing contact between diseased and healthy bison lies south of the Mackenzie River to the Alberta border and between Trout River and Buffalo River.

All bison in this area are presumed to be disease carriers and must be removed for testing. If you see bison in the control zone, please contact your nearest Environment and Natural Resource Officer or call **1-866-629-6438**. For more information visit **www.enr.gov.nt.ca**

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APPENDIX D: RADIO ADVERTISEMENT SCRIPT

Bison populations in Wood Buffalo National Park and the adjacent Slave River Lowlands are infected with disease and must be removed for testing.

A buffer zone lies south of the Mackenzie River to the Alberta border, between Trout River and Buffalo River, to prevent contact with diseased bison.

Motorists and hunters are requested to report any sightings of bison in the buffer zone to the nearest Environment and Natural Resources office, or by calling 1-866-629-6438.

NWT residents play an important part in the bison control program. Thank you for your participation.

APPENDIX E: 2011-2012 BCA EXPENSES

Description	Expense
Air Charters	$66,393.19
Travel and Accommodations	$2,838.35
BCA Technician/Observers – Wages*	$11,227.40
ENR - In Kind Support	$21,650.00
Signs	$5,575.24
Advertising	$3,260.39
TOTAL	**$110,944.57**

*A BCA technician was only hired to conduct the comprehensive survey for the 2011/12 season.

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